

Spatial Analysis with ArcGIS Online

Links

Class Page

<http://guides.lib.virginia.edu/gis>

Click **Teaching Resources > Spring 2024 Workshops**

ArcGIS Online

<https://uvalibrary.maps.arcgis.com/>

ArcGIS Online Analysis Tools Overview

<https://doc.arcgis.com/en/arcgis-online/analyze/perform-analysis.htm>

ArcGIS Online Analysis Tool Use

<https://doc.arcgis.com/en/arcgis-online/analyze/use-analysis-tools.htm>

Create or Login to ArcGIS Online Account

Note: If you're not a UVA affiliate, or don't have an Eservices login, please contact us for options.

Go to: <https://uvalibrary.maps.arcgis.com/>

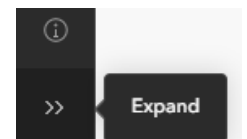
- Click **Sign In**
- Click **University of Virginia**
- Sign in using your NetBadge credentials.

UNIVERSITY OF VIRGINIA

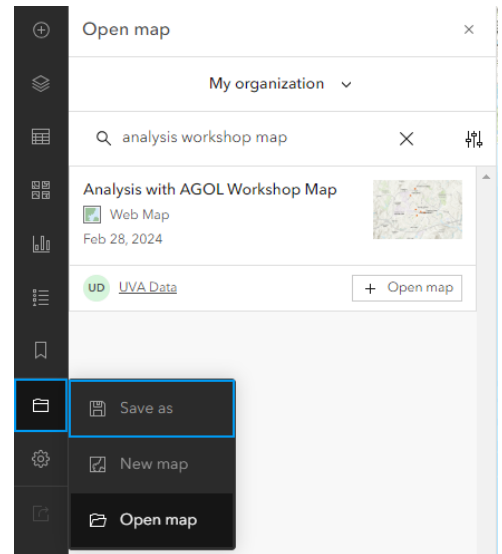
NOTE: If this is your first time logging in, an ArcGIS Online account is automatically created. Continue to use the above instructions to login to your account.

Open the Map

1. Click on the **Map** tab.
2. Expand the toolbars by clicking the **Expand** arrows on the bottom of each toolbar.

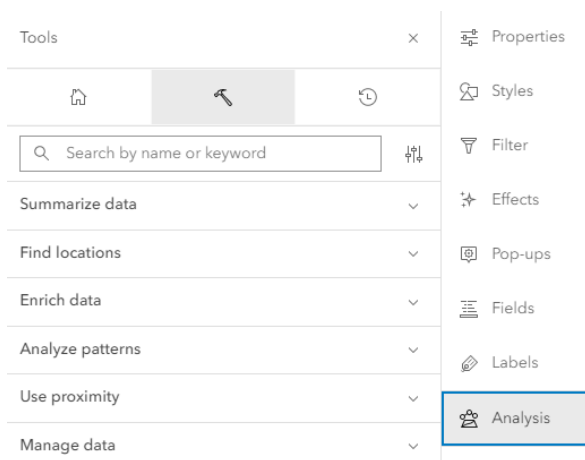


3. On the left toolbar of the Map Viewer, click the **Save and Open** folder icon and click **Open map**.
4. Select **My Organization** (“ArcGIS Online” for non-UVA) from the pull-down. Type “analysis workshop map” into the search bar and hit Enter.
5. Click **+ Open map** on the “Analysis with AGOL Workshop Map” card.
6. Save a copy of the map by clicking **Save and Open > Save as**.



This map has the layers we’re going to use to perform some analysis. However, you’re not limited to these datasets. Feel free to use your own layers or create some quick data with a **Sketch layer** and use that in an analysis.

Analysis



1. Click the **Analysis** button on the right toolbar, then click **Analysis settings** to view the available settings. Click **Cancel** when done.
2. Click the clock icon to open the analysis **History**. Here you can view previously run tools, including parameters and messages. Click the three dots to see additional options. If you want to re-run a tool with a slight change to the parameters, clicking **Open tool** will open that execution where you can make changes and run again. Make sure to change the **Output name** if you re-run a tool.

3. Click the hammer icon to open the analysis **Tools**. The search is useful if you’re looking for a specific tool.

Keep in mind that you must have layers in your map to perform analysis, and some tools require specific data types (points, lines, polygons, or rasters).

Below we’ll walk through the series of analyses performed during the workshop. You can also open each of these tool configurations from the **History** tab.

Spatial Join/Aggregation

We want to know the population of our Neighborhood Planning Areas. Open the attribute table for the neighborhoods layer. You'll notice there's no population data. However, we have a census block point layer that does contain population data. We're going to spatially join block points to the neighborhoods layer and summarize the population data.

1. Expand the **Summarize data** section and click **Join Features**.
2. Configure the tool as below. Leave the default value for any unlisted parameters.

Target layer: Planning Neighborhood Area

Join layer: VA 2010 Census Blocks (Points)

Join Settings: Use spatial relationship

Spatial relationship: Intersect

Multiple matching records: Summarize matching records

+ Field = "POP2010"

Sum statistic

3. Enter a descriptive **Output name** and click **Run**.

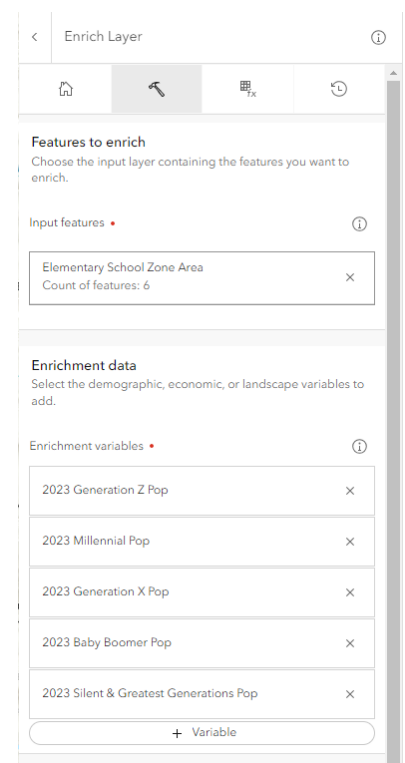
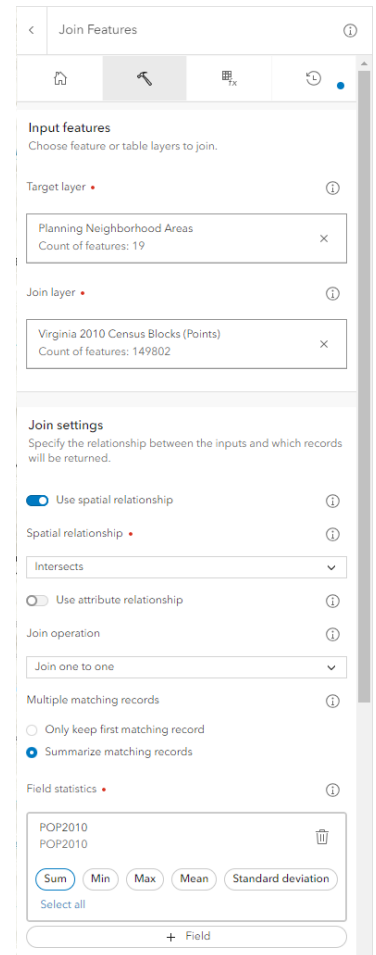
If we swap the layers, making the block points the **Target layer** and the neighborhoods the **Join layer**, the attributes from the neighborhoods layer will be transferred to the points. This way, we can know which neighborhood a block point lies within.

Enrich

Now, we want to get demographics for our Elementary School Zone Areas. We can perform a spatial join with the block points again, but that data is dated and has limited variables. Instead, let's work with the Enrich tool.

1. Expand the **Enrich data** section and click **Enrich Layer**.
2. Select "Elementary School Zone Area" for the Input features.
3. Click + **Variable** to choose the enrichment variables.
4. Enter a descriptive **Output name** and click **Run**.

Look at the various options for demographic variables. In our example, we searched "generation" to get the generation population variables.



Travel Areas

1. Expand the **Use proximity** section and click **Generate Travel Areas**.
2. Configure the tool as below. Leave the default value for any unlisted parameters.

Input layer: Ice Cream Shops

Travel mode: Walking Time

Cutoffs: Enter “5”, click **+Add**

3. Enter a descriptive **Output name** and click **Run**.

*Be sure to save your map often by clicking **Save and open > Save**.

Bonus:

Using your newfound skills, Enrich the Travel Areas layer with variables of your choosing.

The screenshot shows the 'Generate Travel Areas' tool interface. At the top, there's a title bar with a back arrow, the text 'Generate Travel Areas', and an information icon. Below the title bar is a toolbar with icons for home, a hammer (active), a grid, and a clock. The main panel is divided into sections: 'Input layers' with a description and an 'Input layer' dropdown showing 'Ice Cream Shops' (Count of features: 7); 'Optional barrier layers' with a collapse arrow; 'Analysis settings' with 'Travel mode' set to 'Walking Time', 'Cutoffs' set to '5' (with an 'Add' button), 'Cutoff units' set to 'Minutes', 'Travel direction' set to 'Away from input locations', 'Departure time' set to 'Time unspecified', 'Overlap policy' set to 'Overlap', and a checkbox for 'Generate detailed polygons'.